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A CRITIQUE OF ENVIRONMENTAL CONSIDERATIONS IN THE DRAINAGE BASIN ORGANISATIONS IN AFRICA

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Introduction

To give a critique of environmental considerations in the drainage basin organizations in Africa demands, first of all, a survey of such organizations including the projects they have or are undertaking. Secondly, it demands an investigation into the planning, implementation and evaluation of such development projects to see whether the environmental dimensions of the impacts on the land, the economy, the social conditions of the people affected, have been adequately taken into account. Most African Governments now, fifteen years after the Stockholm Conference on the Human Environment, are not asking whether it is necessary to bear the additional cost to the project in order to take environmental considerations into account, but they have learnt from the experience of developing large dams in various drainage basin all over Africa (Volta, Aswan, Kariba and Kianji), that the cost of not adequately carrying out an environmental impact assessment (EIA) at the onset, can be a set back to development. Our Governments have now learnt about the social costs of environmental neglect the hard way, that prevention is better than cure!

Environmental impact assessment (EIA) should be considered as a management tool for the integration of environmental dimensions into development strategies. It is not an expensive ploy to add to the cost of an already expensive development project in terms of foreign exchange, nor should it be construed as an obstacle created by the industrialized countries against Third World economic development. At Stockholm in 1972, the majority of African Governments felt this way. During the 1970s, environmental considerations for economic and social development in African countries have been spelt out in the Lagos Plan of Action for the Implementation of the Monrovia Strategy for the Economic Development of Africa (1980) 1/, and in the International Development Strategy for the Third United Nations Development Decade for 1980-1990 adopted by the General Assembly resolution 35/56 of December 1980.

But since the beginning of the 1980 decade, the adverse impacts of drought and desertification on the social conditions and on the economy of more than two-third of the African countries, have sharpened the focus on the environment/development problematique. The Regional Plan of Action to Combat the Impacts of Drought in Africa 2/, adopted by the ECA Conference of Ministers resolution 499(XIX) in May 1984 as a result of a Scientific Round Table on the Climatic Situation and Drought in Africa, concentrated on short-, medium- and long-term measures to monitor the climate for the prediction of drought. This would facilitate the rehabilitation of agriculture in order to promote self-sufficiency in food production. The Plan also calls for improved strategies for water and energy resources management, soil conservation, and the exploitation of renewable natural resources (forests, fisheries, livestock and wildlife) in Africa.

1/ A/S-11/14, Annex 1. The Lagos Plan of Action and Final Act (1980).
2/ See Rural Progress, Vol.V, N° 2, 1986, pages 3-14, United Nations ECA.

It is within this context of Africa's priority occupation with the adverse impacts of drought and desertification on the economy, coupled with the African economic crisis resulting from the world recession on commodity prices, and leading to dwindling foreign exchange earnings, large debt burden and excruciating debt servicing charges; that groups of African countries are establishing drainage basin organizations to promote overall development in the area and to alleviate the adverse impacts of drought, desertification and related environmental hazards on the economy. The development of lake and river drainage basins in Africa is a positive step towards promoting self-sufficiency in critical human activities such as food production in arid lands through irrigation, development of renewable sources of energy through hydropower and promoting alternative means of transportation through navigation of inland waterways. Because of the economic and financial crisis in most African countries, they cannot afford to intensify the environmental degradation that has persisted over the past decades in their promotion of the development of drainage basins. Hence, environmental impact assessment of major drainage basin development schemes have been a sine qua non for the attainment of sustainable development for the people who are meant to benefit as users of the projects outputs.

The approach in developing a critique of environmental considerations for the development of drainage basins by African Governments, will cover a survey of such basins, followed by the positive and negative environmental impacts that an EIA might show, concluding with what steps African Governments are taking or should take towards mitigating adverse impacts through environmental legislative and administrative measures within the country and the subregional grouping.

Drainage Basin Organizations in Africa

A recent review of River Basin Development in Africa was made by the Water Resources Unit of the Natural Resources Division in the United Nations Economic Commission for Africa (ECA) for the Thirteenth meeting of the ECA Conference of Ministers in April 1987 3/. The main purpose of the paper was not only to inform the Conference on current development activities in drainage basins in Africa, but also to strengthen the concept that river and lake basins are a major instrument for promoting socio-economic development activities for the economic integration of the African region. Development activities taking place in two drainage basins (OMVS and KBO) which are the subjects for discussion in this workshop, are summarized in Table I (annexed) for examining their environmental implications. Since these are related to the ecological conditions of the drainage basin, summaries of the ecology and environment of each of the African drainage basins being developed are provided below:

(a) Senegal River Basin Organization (OMVS) drainage basin of 289,000 square Km is in the Sudano-Sahelian zone with each of the four countries covered, that is Senegal (13.1 percent), Mauritania (26.0 percent), Mali (23.6 percent), Guinea (7.3 percent) being 70-100 percent aridlands and desert. The population is about 1.6 million which is 14 percent of the total in the three OMVS member States, excluding non-member Guinea. In the wet season, the Senegal river is navigable for 950 km to Kayes in Mali, but in the dry season navigation is impeded by low flow rate below 300 m3/sec, causing salt water intrusion upstream for about 200 km, with dire consequences to agriculture (Table 1 provides further details).

3/ Document E/ECA/CM.13/14.

(b) Kagera River Basin Organization (KBO) covers a drainage basin of 59,800 square km distributed among its four member States: Tanzania (35 percent), Rwanda (33 percent), Burundi (22 percent) and Uganda (10 percent). Three of these countries are land-locked, hence inland transportation is very crucial. Also Rwanda and Burundi have a very high population density (146-151 per square km) and being small and hilly countries, prime agricultural land in river valleys are just as competitive as developing dams for hydropower. The KBO drainage basin is in moist savanna woodland vegetation dotted with numerous wetlands of papyrus swamps along the Kagera river and its two main tributaries - the Nyabarongo in Rwanda and the Ruvubu in Burundi. The Kagera Basin has an annual rainfall of 1,800 mm to 2,000 mm to facilitate rainfed agriculture but a few aridland areas exist with 800 mm rainfall. The population in the Kagera Basin is 5.6 million, that is 8.6 percent of the total population of the four KBO member States. The country is very hilly with numerous valleys for crop production by irrigation if necessary (see Table 1 for more details).

(c) The Gambia River Basin Development Organization (OMVG) was established in 1978 comprising of the Gambia and Senegal. In 1980, Guinea joined, followed by Guinea-Bissau in 1983. The OMVG is similar to the OMVS action programme in that an anti-salt barrage is proposed to be built near the month of the river (at Yallintenda or at Balingho), coupled with two storage reservoirs, one dam at Kekreti in the Gambia, 200km upstream and the other dam at Kouya in Guinea, 500 km near the source of river Gambia in the Fouta Djallon Highlands. The OMVG is still at the pre-investment stage with studies progressing on the ecological and socio-economic consequences of the location of the anti-salt barrage and the dams. The vegetation in the area is savanna woodland in the river valley which is located in almost flat sudan savanna semi-aridland.

(d) The Niger Basin Authority (NBA) was created in November 1964 by nine member States through which the river Niger flows 4,200km to the Atlantic Ocean from the Fouta Djallon Highlands in Guinea, north-eastwards through Mali, Burkina Faso, Niger and Nigeria. The main tributaries come from Cote d'Ivoire, Benin, Chad and Cameroon. The Niger river drainage basin of 2 m. square km, covers moist tropical forests at its source, then flows into savanna woodland and sudano-sahel savanna with scattered trees around its inland delta at Mopti, before turning south-eastward through the same vegetation zones towards the coastal delta.

The NBA has instituted two operational projects in Niamey, Niger. In 1978, the Hydro-Niger Project was set up to monitor the level of the river and its tributaries at 52 stations in the nine member States with real-time signals sent by satellite to a computer in Niamey. Analysis of the data enables three month prediction of the river level necessary for planning agricultural irrigation and hydropower production. The other operational project is AGRHYMET Centre, also at Niamey which caters from training in agrometeorology and hydrometeorology for the CILSS member States. However, inspite of this seeming success, the NBA is beset with political and financial problems and the administrative infrastructure is now being reviewed and revitalized by the Council of Ministers in 1986, for a Heads of State Summit meeting in 1987.

(e) Lake Chad Basin Commission (LCBC) was established in 1964 between Chad, Niger, Nigeria and Cameroon. It carried out studies and research up to 1972 when the Heads of State met and created the LCBC Development Fund for the economic and social

growth of the basin. The drainage basin of Lake Chad and its two main rivers Chari and Logone arising from the Central African Republic (not yet a member of LCBC) is in the sudano-sahel zone. Hence the last prolonged drought of 1968-1985 has depleted the lake water down to about one third its normal size. In 1981, a five year development plan was drawn up but its implementation was hindered by the drought and the internal conflict in Chad. The Plan was revised again in 1985 for the promotion of agricultural training, restoration of the lake level by its two rivers, irrigation works and fisheries production. There has also been a return of the LCBC Secretariat to Ndjamena in Chad with a new Executive Secretary in September 1986 and with prompt financial contributions from the four member States, the LCBC has good prospects for promoting development activities in the region.

(f) The Nile Basin covers an area of 2.9 million km2 from its two main sources of the river to its delta in Egypt at the Mediterranean Sea. One source is the White Nile flowing from Lakes Victoria and Kyoga with inputs from Lake Mobutu, covering Zaire, Uganda and Kenya, then through Sudan into the river Nile proper in Egypt. The other source is the Blue Nile originating from Lake Tana in the Ethiopian Highlands and joining the White Nile at the confluence in Khartoum, Sudan. Two main tributaries of the White Nile - Sobat and Atbara also arise from the Ethiopian Highlands. If the rivers flowing into Lake Victoria are taken into account, then the river Nile/Lake Victoria Basin also include the Kagera drainage basin covering Burundi, Rwanda and Tanzania, to give a total of nine riparian states in the basin. No drainage basin organization exists as yet except for a bilateral agreement between Egypt and the Sudan for a joint Technical Committee on the use of the river Nile water.

From its sources in the Great Lakes Basin on the Equator and in the Ethiopian Highlands, the river Nile flows about 6,700 km to the sea. It arises in moist tropical montane forest areas around the tropical great lakes Victoria and Kyoga and in savanna woodlands vegetation of Uganda and southern Sudan. Then it flows through sudano-sahelian scattered tree savanna aridlands, into the hyper-arid Nubian desert, into the Mediterranean scrub with papyrus swamp vegetation zones in the Nile delta. From the ecological data and physical background of the Nile Basin, socio-economic development is most pronounced in the aridlands of Sudan and the desert sands of Egypt, in fact the river Nile has always been the life blood of Egypt for thousands of years. In general, development activities are seen for irrigated agriculture, hydropower, navigation, fisheries and livestock production along the lower Nile. Three such major development projects have been the Aswan high dam which has formed Lake Nasser near the Egypt/Sudan border; then there is the extensive Gizera irrigation scheme below the White and the Blue Nile confluence and in the Kordofan Province in Sudan; and then, the hydro-electric power plant at Jinja in Uganda where the White Nile flows from Lake Victoria. In summary, one can say that the potential for development in the Nile Basin is enormous for most of its reparian states.

(g) The Congo/Zaire Basin covers a drainage basin of 3.7 million km2 as the largest one in Africa even though the length of the main river is about half that of the Nile, at 3,700 km. The source of the river is probably river Chambeshi, Zambia, which flows into Lake Bangweulu from which river Luapula flows into Lake Mweru which empties through river Luvua into river Zaire or Lualuba in that area near Manono airfield 4/. Another source is from Lake Kivu in Rwanda/Zaire border, through river

4/ E/ECA/TRANSP/43: Study on the Establishment of an Intergovernmental Organization for the Congo/Zaire Basin. 250 pages with 10 annexes, 1984.

Ruzizi into Lake Tanganyika from which river Lukuga flows into river Zaire near Kabalo airfield. Below Kisangani, the main tributaries of river Congo/Zaire are Aruwumi, Itimbin, Mongala, the Ubangui and the Sangha all on the right; on the left side are rivers Lulonga, Ikelombo, Ruki entering the main river near Mbandaka and the Kasai just above Kinshasa where the river forms a lake with Brazzaville, Congo on its opposite side, before the river enters the Atlantic Ocean. The lower and middle reaches of the Congo/Zaire basin is in dense lowland tropical rainforest covering Zaire, Congo (and Gabon). The upper basin in Angola, Zambia, southern Zaire, as well as Rwanda, Burundi and eastern Tanzania are in tropical highlands with savanna woodland vegetation and tropical montane forests. The middle basin of the river in lower Cameroon and Central African Republic are also covered by moist savanna woodland vegetation. Numerous large inland swamp occur especially in the middle reaches forming lakes on the main river. The lowland basin has high annual rainfall of 2,000 mm, decreasing to 1,200 mm on the highlands.

The Congo/Zaire basin covers nine riparian states mentioned above, four of which are land-locked (Burundi, Rwanda, Zambia and Central African Republic). The total population of 38 million in the basin represents 46.5 percent of the total in the nine states in 54.8 percent of its total surface area. There is very good potential for development of navigation and transportation, hydropower and fisheries in the equatorial lowlands and irrigated agriculture in the highlands to the north, east and south in the basin. Already the main Congo/Zaire river offers river transportation of 134 km from the Atlantic Ocean port of Boma to Matadi, then 2,960 km from Kinshasa to Kisangani supplemented by short rail links to Bukama. There are also 5,631 km of navigation on tributaries on the right and another 8,344 km on the left side of the main river. The Congo/Zaire river is full of cataracts and water falls impeding navigation in places, but suitable for hydro-electric power generation especially the 32 cataracts on the 320 km river flowing through gorges between Kinshasa and the port at Matadi. The hydro-electric power potential of the drainage basin is estimated at 124 million KW of which a small percentage has been developed 5/.

The hydro-electric power can be exploited mainly for the development of the mineral resources potential in the basin, for an iron and steel industry around Inga, Congo/Zaire, using coal from Lake Kivu area and limestone from the Oubangi area in Central African Republic by river transportation. Also fertiser production (nitrate and phosphates) is possible in Zambia.

As pointed out earlier, irrigated agriculture is not important in the lowland equatorial Congo/Zaire basin but can be developed on a small scale in Zambia and in the Lakes Kivu/Tanganyika areas. Similarly, the closed forest and savanna woodland vegetation are still enormous in the Congo/Zaire drainage basin and this natural forest resource under good and proper management, can become a model to Africa for sustainable development. The ECA study did not estimate the fisheries potential in the river and lake drainage basin but it should be quite substantial in view of the width (4-10 km) and shallowness (in drought) of most of the Congo/Zaire river and its main tributaries.

At present, there is no drainage basin organization for the Congo/Zaire river and lake basin so ECA with UNDP support, in 1983, initiated a study on the possibility

5/ Ibid.

of establishing an intergovernmental organization for the development and exploitation of resources of the basin as surveyed above 6/.

(h) The Zambezi Basin has been a recent focus for study under UNEP's programme "Environmentally Sound Management of Inland Waters" (EMINWA) during the 1985-1987 biennium. Several working group of experts meetings have been held, diagnostic studies have been conducted and a draft Zambezi Action Plan (ZACPLAN) was drawn up. The ZACPLAN should cater for the sound management of the resources of the drainage basin through the integration of environmental concerns into the management of water resources. The countries involved in the ZACPLAN are: Angola, Botswana, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe and the United Nations Institute for Namibia representing the country.

The Diagnostic Study made by UNEP covered the present state of the ecology of the common Zambezi river system, environmental problems encountered and their impacts, and suggested management goals, policies and activities 7/.

The Zambesi drainage basin covers 1.32 million km² with a population of 30 million within eight countries listed above. The main river arises in the Kalene Hills near the borders of Zaire, Zambia and Angola, flows through the Central African Plateau with four falls, three gorges and two man-made lakes (Cabora Bassa and Kariba), including input from Lake Malawi, to its estaurine delta at the Indian Ocean, 3,000 km from the source. The main tributaries of the Zambezi are Kabompo, flowing through the Barotse Plain of the Kalahari desert in Zambia, the Cuando (Kwando) from Angola with floodwater inputs from Okavango swamp in Botswana, the Kafue river from central Zambia, the Luangwa from eastern Zambia, the Mazowe/Luenha from Zimbabwe/Mozambique and the river Shire from Lake Malawi. The vegetation in the Zambezi basin varies from aridland desert scrub in the Kalahari desert in Angola, Namibia, Botswana, Zambia, to semi-arid land tree and shrub savanna in the same countries with about 700-800 mm annual rainfall, on to moist savanna woodlands in Zambia, Zimbabwe, Malawi, Tanzania and Mozambique on the eastern part of the central African plateau with 1,200 mm to 1,700 mm annual rainfall, and finally to swamp grassland and tidal mangrove swamp in the estaurine delta at the mouth of the river.

From the Diagnostic Study done by UNEP 8/, potential economic development activities in the Zambezi Basin cover irrigated agriculture in the arid land areas of the western part of the basin coupled with rangeland development to ease the intensive soil erosion problems in Botswana, Namibia, Angola. There is also good fisheries potential especially in the few navigable areas and in the lakes (both large/small, man-made/natural). About half of the length of main river and a few tributaries are navigable (1,500 km) in five broken sections, more so on Lakes Kariba and Cabora Bassa. Because of the presence of the falls and gorges, the river offers tremendous hydropower potential, already being developed at Kariba and Cabora Bassa. Oil is also available in Angola and coal deposits in

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6/ Op.cit.
7/ UNEP/IC.78/Background paper 1.
8/ Ibid.

Zimbabwe and Mozambique. The basin is also rich in industrial minerals - copper in Zambia and Zimbabwe, bauxite, chromite, gold, nickel, asbestos in Zimbabwe, flourite and iron ore in Mozambique, and limestone (marble), agate, bauxite in Malawi. Hence pollution from mining, manufacturing industries can be a serious environmental problem in the drainage basin. Therefore the ZACPLAN has been drawn up to cover environmental assessment, management, legislation and institution building activities for sustainable development of the drainage basin.

In conclusion, the ecological summary of each of the eight major drainage basins in Africa have indicated the basic scientific data on the physical features, climate, rainfall and vegetation types, soil conditions and hydrographic features of of the rivers and lakes on which impacts of development activities on the natural environment can be evaluated. Now let us consider the process of an environmental impact assessment (EIA) and its relationship to the kinds of development activities that can take place in the major drainage basins in Africa, in the following section.

Environmental Impact Assessment in the Development of Drainage Basins in Africa

As pointed out in the introduction, it is very essential to undertake an environmental impact assessment right at the planning and preparatory stage of the project for any drainage basin development activity. This is necessary because drainage basin development projects are among thpse (including agro-industrial, chemicals) which can have significant negative impacts on the environment and ecological status at the site. Environment impact assessment (EIA) procedure involves first an enquiry stage to determine the nature of the potential impacts on the environment. If necessary, this is followed by a scientific assessment of the impacts through data collection, analysis and evaluation, and it is completed by the issue of an EIA statement summarizing the evaluation and recommending possible actions based on costs and benefits of the project. The link between carrying out an EIA and developing environmental legislation is shown in the collection of baseline data on the potential impacts of the development activity on the environment, and in the analysis of such data to provide useful information. Such a procedure generally forms the basis for developing an environmental policy for management. Thus, environmental impact assessment is not just a technique used by environmental experts to determine the potential impacts of development projects on human and animal health, and on the quality of the environment, it is also a tool for developing national policy for effective environmental management through the environmental legislation process.

To make a critical analysis (critique) of whether drainage basin organizations in Africa have found it necessary to share their experiences on environmental impact assessment (EIA) procedures, methodologies and cost benefits for their effectiveness in promoting environmentally sound development, it is essential to investigate firstly the status of EIA in the few African countries which have established such a mechanism. It is difficult to state by what means African countries have adopted EIA procedures, however, a review of the adoption of EIA by governments globally indicate that some have done it by law (USA), some by administrative decree (Canada, New Zealand) and some governments in the ESCAP region as a matter of national policy. It is also noted that the national EIA provisions can range from just simple statements (GDR), to enabling statements (Columbia), or detailed guidelines co-ordinated with national development planning (Papua New Guinea) 9/.

9/ UNEP/IALS Manual on Environmental Legislation. page 45-53, February 1979.

On the role of environmental impact assessment (EIA) in development activities in African countries, ECA has collected information on this for a Seminar of Legal Experts on Development of Legislation for Environmental Protection in the ECA Region, held in Addis Ababa, in May 1980. The Report of the Seminar 10/ indicated that in 1980 only seven African Governments carried out some sort of EIA activity. It was noted that Ghana carried out EIA of new development projects with the assistance of the National Board of Standards and the Environmental Protection Council. In Ethiopia, NRDC and CPSC Decree n° 156 of 1976 empowered the Executive Committee of the Supreme Council to review and undertake EIA studies of new projects. In Uganda, the Ministry of Industry was responsible for EIA whilst in Zambia and Senegal, EIA was carried out on an ad-hoc basis when necessary. In a few southern African countries, EIA for industrial development is carried out by the investing firm but Government influence is felt through safeguards from natural environmental machineries such as the National Trust Commission in Swaziland, and the Water apportionment Board and the Air Pollution Inspectorate in Botswana 11/.

Some of the difficulties pointed out at the Seminar for Lawyers 12/ for African Governments to establish a mechanism for environmental impact assessment of development projects, was due to lack of trained manpower on EIA methodology and on general environmental assessment techniques. It was noted that during this United Nations Industrial Development Decade for Africa (IDDA) 1980-1990 and with the present economic and social crisis accentuated with the problem of desertification creeping on productive farmlands and rangelands in the arid zones in about two-third of African countries, most African Governments cannot afford the extra project cost for EIA. In fact, on the assumption that the ecological absorptive capacity for dealing with air, water, soil and other pollutants is still generally untouched, African Governments can do with a few smoke-polluting industrial complexes say for cement-making, oil refinery, iron smelters, than none at all!

10/ E/CN.14/ECY/5, Development of Environmental Protection Legislation in the ECA region, 97 pages, 1980, United Nations Economic Commission for Africa.

11/ Ibid.

12/ Ibid.

Because of the importance that most industrialized countries attach to environmental impact assessment (EIA) as an essential tool for ensuring environmentally sound development and for the incorporation of environmental considerations into the decision-making process, a Working Group meeting of Experts on Environmental Law was organized by UNEP at Washington D.C. in June 1984. The purpose of the meeting was to develop principles and guidelines on environmental impact assessment. It is noted that eight out of the 21 experts and observers were from developing countries including only one from Africa. The meeting drafted three goals and 13 principles on EIA which have since been developed into "Proposed Principles and Guidelines on EIA" at a subsequent working group meeting organized by UNEP in Geneva, Switzerland in January 1987 13/.

It is of significance to note that in developing the broad principles and guidelines, the Geneva expert group meeting made a survey of EIA-related activities. in 23 international organizations 14/. ECA can be included among the international organizations who are involved in promoting EIA among African countries as a follow-up activity to the ECA/UNEP Regional Workshop on Industrial Environmental Impact Assessment and Environmental Criteria for the Siting of Industry organized at ECA, Addis Ababa, in June 1983 15/.

So far, this section of the paper has surveyed which African countries have instituted mechanisms for EIA and what role such impact assessment play for incorporating environmental dimensions into the development process. It has indicated that in 1980, less than 20 percent of African countries have any provisions for EIA of a general nature. For the benefit of African countries contemplating the introduction of EIA into development assistance project proposals, the following four of the papers discussed at the Geneva meeting are of relevance to African drainage basin organizations, namely 16/:

(a) the ECE paper which reported the results of case studies on the application of EIA to eleven highway and dam projects in several member States examined by its Group of Experts on EIA. The report pointed out that EIA should be initiated either by legislative action, executive order or by cabinet decision since EIA is an integral part of the project planning and preparation phase to determine potentially significant environmental impacts and to identify project alternatives. Also, monitoring should start very early during project implementation to check against baseline data and to determine unforseen impacts. The environmental impact statement prepared should be available to outside review experts and to the public for comments.

(b) The Economic and Social Commission for Asia and the Pacific (ESCAP) was making a study of the application of EIA on road transport development. It recommended that an initial environment examination (IEE) is necessary before

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13/ Working Group of Experts on Environmental Law - Second session on environmental impact assessment; Geneva, 12-16 January 1987.

14/ UNEP/WG.152/3, Survey of the EIA-related activities of various International Organizations; Geneva meeting, January 1987.

15/ E/ECA/ENV/11, Report of the ECA/UNEP Regional Workshop on Industrial EIA and the Siting of Industry

16/ Op.cit.

an EIA is attempted, and the cost of the EIA should be limited to a fixed percentage of the total project cost because of the bad experience of Thailand and the Philippines in applying EIA to development projects.

(c) UNESCO reported on a joint international symposium on the impacts of large water projects on the environment which should have been held in October 1986. UNESCO emphasized that rather than impact assessment, the risks should be assessed, such as for the use of agrochemicals and for urban management, when the effects on the environment are very uncertain.

(d) The European Economic Community (EEC) reported on a directive issued to its member States in June 1985 that an assessment should be made of all projects likely to have significant effects on the environment, with all member States adhering by July 1988.

(e) The Organization for Economic Co-operation and Development (OECD)'s Environment Committee recommended a list of development assistance projects and programmes which must undergo EIA because of their nature, size and location in terms of adverse impacts and effects on the environment. OECD also examined the constraints to developing countries in the use of EIA and on the experience of aid agencies in funding such projects, especially those dealing with the extractive industries which produce heavy pollutants if not well managed.

Conclusions and Summary

Of the eight major river and lake basins in Africa considered in this paper, it is seen that functional and well managed intergovernmental drainage basin organizations exist in those basins where the riparian member States had of necessity agreed to undertake certain major and costly projects, such as building a barrage for anti-salt water intrusion or for irrigated agriculture in aridland areas, or for a large dam for hydropower production for mining and agro-industry. Such functional drainage basin organizations are CIVS, OMVG, the Niger Basin, Chad Basin and the Kagera Basin. Even though the older organizations are not as effective as the most recently established, a common factor for effectiveness is that the intergovernmental body must function at the Heads of State level for total political commitment in terms of financing the projects.

Of the remaining three major drainage basins which are the largest in Africa and with the greatest potential of natural resources base for promoting regional economic integration, no overall intergovernmental co-ordinating bodies except for bilateral co-operation agreements on specific issues, have yet been established. ECA has initiated action on the Congo/Zaire basin and on the Nile basin while UNEP's inter-agency programme (EMINWA) has developed the Zambezi Action Plan (ZACPLAN) for the sustainable development of the drainage basin 17/.

If a model is required for the establishment of intergovernmental drainage basin organizations in Africa or for the review of existing bodies having management and other problems, the ZACPLAN is to be recommended. It provides certain guidelines for the achievement of the agreed goals and objectives. Based on this critique on the environmental considerations of drainage basin organizations in Africa, the following recommendations are suggested:

17/ UNEP/IG.78/3.

(a) Intergovernmental bodies for the management of drainage basins in Africa must function at the highest political level for effectiveness;

(b) In formulating the Action Plan or overall programme for development activities, environmental considerations should include assessment components, environmental management, legislation, institutional framework, financial arrangements and supporting measures for creating environmental awareness in the drainage basin population;

(c) Drainage basin development is one of those activities leading to severe environmental health problems of water-borne diseases, water and marine pollution from industrial wastes, and so environmental impact assessment (EIA), risk assessment and regular monitoring are absolute necessity for environmentally-sound management;

(d) Since the majority of African member States, even those involved in drainage basin development, have a long way to go in adopting EIA mechanisms for projects requiring it, and in developing supporting environmental legislative and administrative measures to implement EIA recommendations, it is incumbent on African governments to give EIA serious political thought and action as soon as possible;

(e) African Governments must be convinced that drainage basin development incorporating EIA, is an integrated management tool promoting subregional co-operation to solve environment/development problems such as drought and desertification, deforestation and soil erosion, food and energy self-sufficiency, poverty and basic needs satisfaction;

(f) In other words, drainage basin development can promote sustainable development in Africa based on the World Commission on Environment and Development recommendations. It can also promote self-sufficiency in critical human needs (food, energy, water) and self-reliant development in Africa as annunciated in the Lagos Plan of Action (1980) and its recent, subsequent African Priority Programme for Economic Recovery (APPER) 1986-1990.

ANNEX

Environmental Implications of Drainage Basin Development Activities

DRAINAGE BASIN ORGANISATION	Infrastructures and dates	DEVELOPMENT ACTIVITIES: Agriculture & Irrigation	Navigation and transportation	Hydropower	Environmental Effects on Health and on Nature Protection
SENEGAL RIVER BASIN ORGANISATION (OMVS)	.Established in March 1972 in Dakar. .Member States: Senegal, Mali, and Mauritania .Source Fouta Djallon; 4 tributaries; area of basin 289,000 km^2, total length of Senegal river 1600-1800km. into Atlantic Ocean	.Two dams being constructed now: .Diama dam near St. Louis, anti-salt dam, to irrigate 42,000 ha. .Manantali dam on Bafing river in Mali to irrigate 255,000 ha. .Target Yr.2000 is 375,000 ha. for sugar, cereals, groundnut and livestock(1.2m cattle)	.Two ports to be developed: .St. Louis, Senegal at Attlantic Ocean .Kayes, Mali 950 km inland for land-locked Mali, with round-year traffic .Seven-ports along Senegal river to Kayes, Mali.	.Manantali dam to produce 800m KWh in Mali. .Potential dams: Galongo-152Om, Gour Basis-104m, Corana-560m, Felou-400m, Total-2584mKWh .Transmission lines to be constructed.	Positive effects (see 6 columns) Negative effects .12,000 people in 15 villages to be resettled on higher ground due to dam/lakes formed. .Loss of nutrient mud and sediment load from annual river floods lead to reduced fisheries and coastal erosion. .Loss of 130,000-310,000 ha. of wildlife habitats. .Increase in water-borne diseases-malaria, river blindness. .Increase pollution of river from agro-chems, mining and municipal wastes with increasing population Total Cost US$ env US$
KAGERA RIVER BASIN ORGANISATION (KBO)	.Established in August 1977 at Rusumo. .Member States Rwanda, Burundi, Tanzania Oct. 1981 Uganda acceded. .Source - Rwanda highlands, 2 tributaries; area of basin 59,800 km^2; total length of Kagera is 840 km into Lake Victoria.	.Intensified rainfed agriculture to balance irrigated agriculture due unsuitable terrain in river basin .3 out of 7 sites selected for limited irrigation of 24,200 ha.over 10 years for maize, root crops, banana, soya bean plantations. .Rainfed agriculture to be improved in 53,000 ha. to double production.	.Rwanda, Burundi, Uganda as land-locked countries, rely on lake and road/rail links to Mombasi, Kenya and to Dar es Salaam, Tanzania, to the sea. .KBO plans new rail (201lkm) and road (1540km) networks in 4 countries. It will develop 2 ports on Lake Victoria for middle corridor rail link Musomo-Arusha-Tanga seaport.	.Action plan found peat, gas, methane gas, wood fuel energy sources not cost effective for development. .Selected 8 sites for hydropower prodn. of 1329 yr. total for 1988-1990. Rusumo 270 GWh, Kakono 126 GWh, & Gitega 117 GWh, .Potential sites (GWh) Burundi: 32 = 1631 Rwanda: 16 = 257	.Rusumo dam at 3 elevations 1345, 1335,1325m would cover land surfaces of (63, 42, 26) x 10^3ha, with useful areas covered as 33%, 25%, 14% respect. People displaced as (26,12,2.7) x 10^3. .Rusumo dam has little effect on Kagera National park but Kishanda dam will flood the park and dry the river downstream, destroying ecology also. .Increase in water borne disease but no mention of impact of agro-industrial and mineral mining waste on pollution of rivers and lake basins. Total Cost 3.19 bn, env. 2.5m US$

ANNEX

Environmental Implications of Drainage Basin Development Activities

DRAINAGE BASIN ORGANISATION	Infrastructures and dates	DEVELOPMENT ACTIVITIES: Fisheries	Forestry	Industries (mining & agro-based)	Environmental Effects on Health and on Nature Protection
ENEGAL IVER ASIN RGANI-ATION OMVS)	.Established in March 1972 in Dakar. .Member States: Senegal, Mali, and Mauritania .Source Fouta Djallon; 4 tributaries, area of basin 289,000 km^2, total length of Senegal river 1600-1800km. into Atlantic Ocean	.The two dams to regulate river flow to 300cm^3/sec will reduce river fish catch from 50000 to 13000 tons per year. .Potential for agriculture and fisheries in 50,000 ha lake of Manantali dam, and 30,000 ha Lake of Diama dam.	.Senegal river delta & basin with high forestry potential for savana woodland trees in 60,000 ha. land. .Agroforestry potential also in irrigated areas	Hydro-electric power at Manantali to develop minerals: Senegal Iron ore-600 m tons Mali Iron ore - 2000m. tons bauxite - 800m. tons Mauritania Phosphate - 4m tons.	Positive effects (see 6 columns) Negative effects .12,000 people in 15 villages to be resettled on higher ground due to dam/lakes formed. .Loss of nutrient mud and sediment load from annual river floods lead to reduced fisheries and coastal erosion .Loss of 130,000-310,000 ha. of wildlife habitat . .Increase in water-borne diseases malaria, river blindness .Increase pollution of river from agro-chems, mining and municipal wastes with increasing population. Total Cost US$ _____ env US$ _____
AGERA IVER ASIN RGANI-ATION KOBO)	.Established in August 1977 at Rusumo. .Member States: Rwanda, Burundi, Tanzania Oct.1981 Uganda acceded. .Source - Rwanda highlands; 2 tributaries, area of basin 59,800 km^2, total length of Kagera is 840 km Lake Victoria.	Main source of catch is now Lake Victoria but Action plan will provide additional dam .Lakes to increase fish catch from 2x in Rwanda (621 tons) and 10x in Burundi (155 tons).	Action plan proposed planting 30,000 ha of forest in the basin.	potentials Nickel .. 40,000 tons Nickel } -30,000tons Cobalt } peat-900,000tons iron ore- tons Agro-industry sugar-70,000tons animal feed-10,000t malt-4000tons fertiliser-490,000t.	.Rusumo dam at 3 elevations 1345, 1335, 1325m would cover land surfaces of (63,42,26) x 10^{3}ha, with useful areas covered as 33% 25% 14% respect. People displaced as (26, 12, 2.7) x 10 . . Rusumo dam has little effect on Kagera National Park but Kishanda dam will flood the park and dry the river downstream, destroying ecology also. .Increase in water borne diseases but no mention of impact of agro-industrial and mineral running waste on pollution of rivers and lake basins. Total Cost 3.19 bn, env. 2.5mUS$